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P A P E R S  
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M E C H A N I C S.

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No. I.

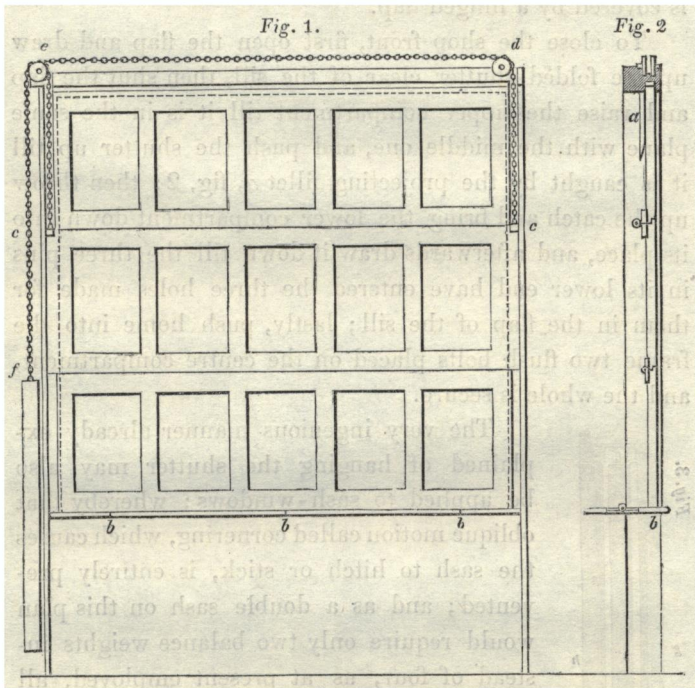
SHOP-SHUTTERS.

*The SILVER ISIS MEDAL was presented to Mr. C. BUSH,  
7, Garden Row, Camberwell, for his Folding Shutters  
for a Shop Front, a model of which has been placed  
in the Society's Repository.*

THE primary object of Mr. Bush was to adapt sliding shutters to the open shop-fronts of brokers and others, as being more manageable, and taking up less room, than the common movable shutters, and giving at least equal security.

The shutter consists of three parts joined vertically together by means of hinges. The middle part is about an inch and a quarter wider than the others, to enable it to run up and down in a groove or recess at each end of the frame, in which groove the lifting chains also work. In fig. 1, *cc*, which is a front, shews the two chains attached to the upper corners of the middle part of the shutter; one of these passes over the single pulley *d*,

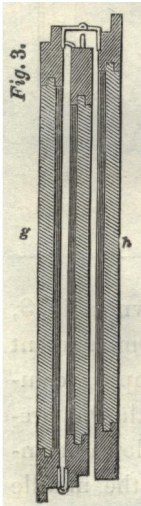
then over the double pulley *e*, and is fastened to the head of the weight *f*; the other is fastened to the same weight, after only passing over the double pulley. Hence it is evident, that if the respective length of the chains is once adjusted so as to allow the shutter to move up and down in a truly vertical position, it will always remain so.



The method of folding up the shutter is shewn in fig. 3, which is an end view; *g* is the middle compartment thrown back and fronting inward; *h* is the upper compartment fronting outward, and connected with the preceding by the hinge; between these lies the lower compartment, connected below, by a hinge, with the middle part, and fastened temporarily to the same at top by a

catch; there is also seen a pin (one of those marked *bb* in fig. 1), by means of which it is fastened, when the shutter is in its place, to the sill of the window. The shutter, when folded as above described, is thrust down into a cavity below the window-sill, the depth of which need be only about one-third of the shutter's height, and is covered by a hinged flap.

To close the shop front, first open the flap and draw up the folded shutter clear of the sill, then shut the flap and raise the upper compartment till it is in the same plane with the middle one, and push the shutter up till it is caught by the projecting fillet *a*, fig. 2; then throw up the catch and bring the lower compartment down into its place, and afterwards draw it down till the three pins in its lower end have entered the three holes made for them in the flap of the sill; lastly, push home into the frame two flush bolts placed on the centre compartment, and the whole is secure.



The very ingenious manner already explained of hanging the shutter may also be applied to sash-windows; whereby that oblique motion called cornering, which causes the sash to hitch or stick, is entirely prevented; and as a double sash on this plan would require only two balance weights instead of four, as at present employed, all possibility of their getting foul of each other may be avoided, by placing them on different sides of the window-frame.

## CORRIGENDA IN FIRST PART OF VOL. L.

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- Page 11, 5 lines from bottom, for height, and place the connecting bar g, read height and place, the connecting bar g.*
- 13, *line 2, for ; then unclamp read , first unclamping.*
- 14, *5 and 8, for b read l.*
- *16, for lie read lies the bar.*
- 26, *8, after grs. add of morphia.*
- 33, *16, dele working.*
- 39, *3, for latter read former.*
- *10, after to add air and.*
- 53, *8, 11, 27, 31, for bar or bars read arm or arms.*
- *14, for 2 read l.*
- 55, *21, dele subsequently.*
- 57, *14, dele and.*
- 58, *3 from bottom, for c c, which is a front, read which is a front view, c c.*
- 59, *5 from bottom, dele thrown back and, and insert the same in the next following line, after compartment.*
- 63, *5, for covered read high-pressure.*
- 69, *5 from bottom, for right angles read the angle.*
- 84, *9, after horns insert e.*
- 86, *12 from bottom, dele (as in figure 15).*
- 90, *1 and 2, omit alternate.*
- *6, omit half the planks retain their original thickness, and.*
- *9, omit half.*
- 91, *6 from bottom, after separate add in perspective.*
- , *last line, after Fig. 1 add the two other arms of this knee are horizontal, and at right angles to each other, one of them being parallel to the side of the ship, and the other perpendicular to it.*
- 99, *last line, for 1 read 2.*
- 100, *line 1, for 2 read 1.*
- 108, *6 from bottom, read the first part of this sentence as follows :*  
*A straight bar projects from the hinder part of the plate f, and to this is attached a crank g in such a position that the end of its lower arm shall move vertically whenever the bar attached to f is moved horizontally.*
- 109, *4, for ring, twice repeated, read swivel.*
- 110, *23, for the sentence the weight to end of g, substitute the weight l on the spindle i balances the spiral m, the weight o on the crank balances the copper plate and horizontal bar, and another weight at the right hand end of the bar g (not shewn in the engraving), balances the weight of the wire.*
- 144, *4, after entire add machine.*
- 155, *11 from bottom, for shave read have.*